

**MODIS GEOPHYSICAL PARAMETERS
ALGORITHM DEVELOPMENT AND VALIDATION
OVERVIEW**

**PRESENTED TO

EOS SCIENCE EXECUTIVE COMMITTEE**

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**BY

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MODIS GEOPHYSICAL PARAMETERS ALGORITHM DEVELOPMENT AND VALIDATION

OCEANS

SPACECRAFT

- SEAWIFS-- (OCEAN GROUP)**
- ADEOS OCTS-- (CARDER)**
- ERS-1 ATSR-- (BARTON)**
- AVHRR--(BROWN)**
- DMSP/SSM/I**
- NIMBUS TOMS**

AIRCRAFT

- COMPACT AIRBORNE SPECTRAL IMAGER (CASI)-- (ABBOTT)**
- AIRBORNE OCEANOGRAPHIC LIDAR (AOL, TWO 256 CHANNEL SPECTRORADIOMETERS ON NASA P-3-- (HOGE)**
- CSIRO AIRBORNE OCEAN COLOR SCANNER/1991-1992 (PARSLOW)**

SHIPS

- MODIS CRUISES WITH JGOFS/ONR, 1992-1995, AND MODIS SPECIFIC, 1994-1998, WITH SPECIAL BIOOPTICAL MEASURING CAPABILITIES/3 CRUISES PER YEAR-2 COASTAL AND 1 BLUE WATER CRUISE/YR ALTERNATING EACH YEAR, 1994-20XX, (CLARK): EXAMPLES OF ON-BOARD INSTRUMENTATION, ETC.,**
 - SPECTRAL TRANSMISSOMETER AND RADIOMETER (STAR-2.2 NM RES.), LICOR SCANNING DOWNWELLING SPECTRAL IRRADIOMETER, SPECTRON ENGINEERING SPECTRAL RADIOMETER, FILTER PAD TRANSMISSOMETER (CARDER)**
 - ON-DECK INCUBATIONS WITH DECK INCUBATORS, PUMP-PROBE FLASH FLUOROMETER (ESAIAS)**
 - CCD CAMERA, ELECTRO-OPTICS RADIANCE CAMERA (GORDON)**
- SHIPS OF OPPORTUNITY WITH ABRIDGED BIO-OPTICS, MULTIPLE/YR, 1992-1998**
- SHIP-BOARD RADIOMETERS FOR SST (BROWN)**

OCEANS (CONTINUED)

SURFACE INSTRUMENTATION

- DRIFTING BUOYS/DROGUE DRIFTERS/ARGOS-TRACKED FOR SST (100/YR FOR 5 YRS) (BROWN)**
- MARINE OPTICAL BUOY SYSTEM (MOS) ON MOORED BUOYS-5 SITES:TWO U.S. SITES, 1 FRENCH SITE, AUSTRALIAN SITE AND ARGENTINE SITE (CLARK)**
- 100 OPTICAL DRIFTERS/YR WITH ARGOS LINKS (ESAIAS)**
- WALLOPS/NASA 0.75 DIAMETER CALIBRATION SPHERE**

ANCILLARY FIELD CAMPAIGNS (POTENTIAL SHIPS OF OPPORTUNITY)

- PACIFIC COAST EXPERIMENTS WITH THE U OF WASH , 1992-1994 (ABBOTT)**
- TOGA**
- WOCE FOR SST**
- JGOFS FOR SEAWIFS AND HOGE/P-3 AOL/MID-ATLANTIC BIGHT**
- INTENSIVE FIELD MEASUREMENTS IN TASMANIAN COASTAL WATER/1991 AND BEYOND, CSIRO DIVISION OF FISHERIES AND OCEANOGRAPHY ON-GOING FIELD CAMPAIGNS (PARSLOW)**

MODIS GEOPHYSICAL PARAMETERS ALGORITHM DEVELOPMENT AND VALIDATION PLANS

ATMOSPHERE

SPACECRAFT

-NOAA TOVS, AVHRR, LANDSAT TM, GOES/VAS, METEOSAT

AIRCRAFT

**-ER-2 MODIS-N AIRBORNE SIMULATOR, CLOUD AND AEROSOL LIDAR SYSTEM (CALS),HIGH RESOLUTION INTERFEROMETER SOUNDER (HIS), MULTISPECTRAL ATMOSPHERIC MAPPING SENSOR (MAMS)
-UNIV OF WASH. C-131A CLOUD ABSORPTION RADIOMETER(CAR)
-UK MET OFFICE C-130 MICROWAVE AIRBORNE RADIOMETER SCANNER (MARS)
-FRENCH ARAT FOKKER F-27 POLDER**

SURFACE INSTRUMENTATION

**-GLOBAL SUNPHOTOMETER NETWORK TO OBTAIN SPECTRAL AEROSOL OPTICAL THICKNESS AND AUREOLE MEASUREMENTS IN THE ALMUCANTOR
-GROUND-BASED MEASUREMENTS IN THE SAHELIAN REGION (TANRE)
-GROUND-BASED HIS IN COLORADO/CIRRUS CLOUDS
-BIOMASS BURNING IN BRAZIL (TANRE AND KAUFMAN)**

FIELD CAMPAIGNS

**-FIRE CIRRUS IFO (COFFEYVILLE, KS)--NOVEMBER 1991
-MAS SCIENCE/ENGINEERING FLIGHTS (20 HRS/YR)
-ARTIC STRATUS, HAZE AND SEA ICE (BARROW)--APRIL 1992
-ASTEX (AZORES) -- JUNE 1990, 1992
-HAPEX (NIGER)--AUGUST-OCTOBER 1992
-BIOMASS BURNING (BRAZIL)--SEPTEMBER 1992
-TOGA-COARE (KWAJZLEIN)--DECEMBER 1992
-GEWEX**

MODIS GEOPHYSICAL PARAMETERS ALGORITHM DEVELOPMENT AND VALIDATION PLANS

LAND

SPACECRAFT

- AVHRR (GLOBAL 1-KM, 5 CHANNEL MULTIYEAR DATASET)
- LANDSAT TM
- SPOT/HRV
- METEOSAT/GOES
- OTHER NON-U.S. SATELLITE MISSIONS (E.G., ERS)
- FUTURE U.S. SYSTEMS (E.G., TRMM)

DIGITAL TERRAIN DATA

- DIGITAL ELEVATION MODIES (30M, 100M, 1KM)
- DIGITIZED TOPOGRAPHIC MAPS (1:25K, 1:50K, 1:250K, 1:1M)

AIRCRAFT/SENSORS

- MULTISENSOR AIRBORNE CAMPAIGNS (MAC'S)
 - ASAS, TMS, AVIRIS, POLDER, TIMS, STEREO PHOTOGRAPHY
 - MODIS AIRBORNE SIMULATOR (MAS)
- LIGHT AIRCRAFT (LOW LEVEL)
 - RADIOMETER, CCD CAMERAS, ETC.

SURFACE INSTRUMENTATION

- CROSS-CALIBRATED GROUND INSTRUMENTATION (VARIOUS)
 - THERMAL RADIOMETERS, SCANNERS
 - TRANSMISSOMETER NETWORK (15-20 INSTRUMENTS)
- BASELINE TEST SITES
 - IGBP (INTERNATIONAL, LTER AND NATIONAL PARK SERVICE (NPS) SITES
ACCOMPANIED BY AIRCRAFT OVERFLIGHTS OF THE TYPES INDICATED ABOVE

FIELD EXPERIMENTS

- 1992 WEST AFRICAN/SAHEL (SALT) TRANSECT
- BOREAS IN 1993-1995
- SOUTHERN AFRICA TRANSECT, 1994
- BRAZILIAN EFFORT IN RAIN FOREST W/IDS INVESTIGATORS, 1996
- GEWEX, 1996-

**MODIS Geophysical Parameters
Algorithm Development and Validation
Data Resources**

Calibration

Spacecraft

- SeaWiFS
- AVHRR
- Landsat TM
- GOES
- SPOT/HRV

Aircraft

- ER-2 MODIS-N Airborne Simulator (MAS)
- Visible Spectrometer

Digital Terrain Data

- Digital Elevation Models (30m, 100m, 1km)
- Digital Topographic Maps (1:25K, 1:50K, 1:250K, 1:1M)

Surface Instrumentation

- Cross-Calibrated Ground Instrumentation (Various)
- Baseline Test Sites
 - White Sands

Field Experiments

- White Sands